

bls Berkeley Linguistics Society

Rhyme or Reason? A Look at Syllable-Internal Constituents

Author(s): Stuart Davis

Proceedings of the Eighth Annual Meeting of the Berkeley Linguistics Society (1982), pp. 525-532

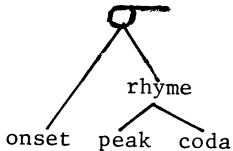
Please see “How to cite” in the online sidebar for full citation information.

Please contact BLS regarding any further use of this work. BLS retains copyright for both print and screen forms of the publication. BLS may be contacted via <http://linguistics.berkeley.edu/bls/>.

The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](http://eLanguage.org), the Linguistic Society of America's digital publishing platform.

Rhyme, or Reason? A Look at Syllable-Internal Constituents
 Stuart Davis
 University of Arizona

Within current work on metrical phonology, the syllable is analyzed as consisting of onset (syllable-initial consonantism), peak (nuclear vowel or syllabic consonant), and coda (syllable-final consonantism). The validity of these ultimate constituents of the syllable is unquestioned. But it has further been argued (e.g., by Selkirk (1978), McCarthy (1979), and Halle & Vergnaud 1978, 1980)) that peak and coda are obligatorily grouped together to form a universal syllable-constituent, the "rhyme". The proposed tree-diagram for syllable-structure in this theory is the following:



In this paper, however, I will offer evidence demonstrating the invalidity of the arguments previously taken to establish the constituency of the rhyme. This same evidence, along with other data, requires one to posit a flat structure for the syllable -- i.e., one with no internal constituents other than onset, peak, and coda -- as is illustrated by the following diagram:



Some of the arguments heretofore adduced in support of the rhyme include the following:

A) The existence of phonotactic constraints between peak and coda:

"The grouping of peak and coda into a constituent is advocated as a universal of syllable composition ... The claim made is that cooccurrence restrictions between peak and coda are always more likely to exist than are restrictions between either peak or coda and the onset." (Selkirk 1978:5)

"Whereas practically any onset can be combined with any rhyme to form a proper English syllable, there are severe limitations on what peak can precede what coda." (Halle & Vergnaud 1978)

B) Reference to the rhyme in stress assignment rules:

"... in all languages known to us, stress assignment rules are sensitive to the structure of the syllable rime, but disregard completely the character of the onset." (Halle & Vergnaud 1980:93)

"... if the rhyme is a structural unit then no language can assign stress by reference to weight or any other property of C₀V sequence." (McCarthy 1978:8)

C) Mention of the rhyme in other language specific rules:

"French vowels assimilate in nasality to the following tautosyllabic consonants. Therefore, the rhyme is the domain of the feature (+ nasal)." (McCarthy 1979:454)

D) The existence of a durational relationship between peak and coda:

"Evidence such as that provided by Chen (1970), who claims that there is a constancy in the length of the vowel plus stop combinations, could be taken as supporting the existence of the rhyme...[O]ne could say that within a constituent like the rhyme the duration of one element is adjusted in function of another." (Selkirk 1978:8)

The above arguments are supposed to support the constituency of the rhyme because the kinds of evidence that they involve have been taken as valid indicators of constituency. However, if such evidence is valid for establishing constituency, then it turns out that onset and coda, as well as onset and peak, can also be considered syllable constituents, for, — as I will show — the same sorts of phenomena can also occur between them.

First, let us consider claims from phonotactics. In the literature on English phonotactics, the existence of various constraints between peak and coda have been pointed out. As far as I am aware, though, nowhere in this literature is there a discussion of the systematic constraints that hold between onset and coda. But I have found a number of such constraints, and they indeed appear to be systematic. It is not the case, for English, that "any onset can be combined with any rhyme." Observe the following constraints on monosyllabic words:

- 1.) If a word has a two-slot onset and a one-slot coda, then the second slot of the onset and the first slot of the coda cannot have the same consonant (thus, C₁C₂VC₁ forms like *fli₁l₁ are not possible; state and the clipping, stat are the only noteworthy exceptions).

Along these lines are a number of other constraints:

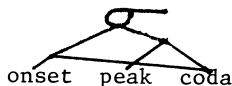
1a) No word can occur with two slots in the onset and two slots in the coda such that the second slot of the onset is the same as the first slot of the coda (thus, $C_1C_2VC_1C_2$ forms like *flilt are not good, as well as mirror-image words with two consonants in the onset).

1b) If a nasal occurs in the second slot of the onset, no nasal can occur in the coda (e.g., *snam).

1c) If an onset has three slots, then the consonant in the third slot cannot occur in the coda (*splal, *strark).

Phonotactic constraints also occur between onset and peak. For example, Pike and Pike (1947:87) mention the following constraint in Mazatec: "...[N]asalized vowels may not be preceded by v, y, l, r or their clusters, nor by m, n, ñ." More simply put, the class of sonorant consonants cannot occur before nasalized vowels. (The occurrence of /v/ with this class is probably accidental, given its infrequency in Mazatec). That it is a natural class which cannot occur before nasalized vowels suggests the restriction is systematic.

The above data from English and Mazatec indicate that there can be systematic dependencies between onset and coda, as well as between onset and peak. Thus, the proposed limitation of phonotactic constraints to members of the syllable rhyme cannot be maintained, since this would make it impossible to state the English and Mazatec restrictions just discussed. A theory of syllable structure which incorporates the rhyme as a universal constituent cannot, therefore, be based on an argument from phonotactic constraints, since such an argument — applied to English — would yield the following syllable structure with "double motherhood" for the coda:



The implausibility of such a structure leads one to conclude that phonotactic constraints are not a test for constituency.

Probably the strongest argument for the rhyme is that, in many languages, the makeup of peak and coda is crucial in rules of stress placement. (It is worthwhile to note, though, that — according to surveys, such as Hyman (1977) — syllable-weight plays a role in stress-placement only in a minority of languages.) However, Halle & Vergnaud's claim that "stress assignment rules ... disregard completely the character of the onset" goes too far, since they do not consider additional evidence which falsifies their claim. There are, indeed, languages which have onset sensitive stress-rules:

the Arandic languages of Central Australia are a primary example. In Aranda (the main language within Arandic) the stress-assignment rule essentially states that, for words of more than two syllables, stress falls on the first syllable containing an onset. Thus, if the word begins with a consonant, then stress is placed on the first syllable, but, if the word begins with a vowel, then stress occurs on the second syllable. The following examples, taken from Strehlow (1942), illustrate the rule in question:

tárama - to laugh	imáña - arm
kútuṇula - ceremonial assistant	arálkama - to yawn
tó:turatùra - marsupial mole	ulámbalamba - fowl (sp.)

Yidin^y (another Australian language), described at length by Dixon (1977), also has a stress-rule that is onset-sensitive. In Yidin^y, stress is usually assigned to the first syllable containing a long vowel (and, in words of three syllables, this will always be the second syllable), but Dixon mentions the following exception to this generalization: "If the third syllable of a trisyllabic word is closed and begins with a stop or w, and the second syllable is open and begins with a lateral or rhotic, then vowel length and stress are likely to shift from second to third syllable. And, thus, he claims, "the main preference seems to be for the stressed syllable to begin with a stop or w and for it not to commence with a lateral or rhotic." (It should be mentioned, however, that Nash (1979/80) disagrees with Dixon's account of the data, and proposes an account of Yidin^y stress that is not onset-sensitive.)

Another language that appears to have a stress rule that is onset sensitive is the New Guinea language Gadsup. In their brief description of stress in this language, Frantz & Frantz note that "... syllable ... with a phonetic stop onset have more stress than those with nonstop onset."

The existence of such stress-assignment rules, which are sensitive to the character of a syllable's onset, constitutes evidence against Halle & Vergnaud's argument for the universality of the rhyme. For, as McCarthy has observed "... if the rhyme is a structural unit, then no language can assign stress by reference to weight or any other property of C₀V sequences." Since there are such languages, then, the rhyme cannot be an obligatory (universal) structural unit, within the syllable. And so we further see that stress-rules do not provide an argument for syllable-internal constituency, either.

Similar to the argument for the rhyme just criticized above is the contention that the rhyme forms the domain of phonetic spreading-rules. Against this claim, one can mention that phonetic spreading-processes, such as nasalization, do not necessarily have just peak and coda as their domain -- as McCarthy's French nasalization example would seem to imply. Palatalization and labialization

often apply over the onset and the peak (that is, a high vowel or a round vowel will often spread its features onto a preceding consonant). Examples of such languages include Nupe (in which front vowels condition palatalization of the preceding consonant, while round vowels condition labialization), and also Lugisu, a Bantu language, in which a round vowel likewise conditions labialization in the preceding consonant. In these languages the domain of the feature [+round] or [+high] is the onset plus the peak. McCarthy's phonetic spreading-evidence, then, does not constitute an argument for the rhyme's being a constituent, unless onset and peak are also to be viewed as forming one.

A more sophisticated argument for the rhyme is the claim that certain language-specific rules require reference to rhyme-structure in their description. In fact, many recent analyses propose rules in which rhyme-structure is mentioned. But some of these analyses would be compelling over alternate analyses not referring to the rhyme only if the rhyme could be established as an obligatory universal on independent grounds. Phonological rules, though, that do require reference to peak and coda in their description are not necessarily arguments for a rhyme-constituent, but are also consistent with a flat syllable structure — which would allow the different parts of the syllable to interact. This is because phonological rules may, in the general case, involve non-constituents. For example, non-constituents can be involved in such processes as nasal-harmony, vowel-harmony, dissimilation, and metathesis, which can all occur over syllable boundaries. So, to reiterate, the mere fact that peak and coda are mentioned in a phonological rule does not constitute an argument for their forming a syllable-internal constituent. This conclusion means that not much of the proposed evidence is still left to motivate the rhyme.

One of the remaining arguments for the rhyme (and the last one to be dealt with here) is that of Selkirk (1978), who claims that the rhyme is a durational unit, in the sense that, within the rhyme, the duration of one element is adjusted as a function of another. Here, it is, firstly, interesting to note that, in some languages (such as Russian), the onset and the peak form a durational unit, in CVC-syllables. Secondly, if Selkirk's argument is to be valid, it must be the case that a temporal relationship exists only between a vowel and the following consonant in the same syllable (in a VC\$ sequence), and not across syllables (as in a V\$C sequence in a CVCV word). The reason for this is that, if a temporal relationship is an argument for rhyme constituency, then such a correlation between V and C over a syllable-boundary would establish the absurd conclusion that members of two separate syllables form a constituent within one syllable. But, obviously, a V\$C sequence cannot be a syllable-internal constituent. However, studies of languages in which there is a temporal relationship between a vowel and the following consonant appear to indicate that

just such a relationship does hold across syllable boundaries. Kim's (1975) study of temporal duration in the segments of Korean nonsense-forms indicates that the syllable boundary has no effect on the relationship between a vowel and the following consonant. From his data, Kim concludes the following:

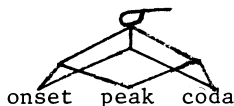
"If the syllable boundary plays any role in the temporal interaction between adjacent segments, we would expect the adjacent segments across the syllable boundary to show a less significant negative correlation [temporal relationship]. However there is no such evidence ...

Kim's conclusion about Korean is also paralleled by research on other languages done by other researchers. Lisker's (1978) study of English nonsense forms and Chen's (1970) French data both seem to indicate that syllable boundaries do not effect temporal compensation in these languages (although these studies were not specifically designed to prove this point). The following are some of Lisker's data:

English nonsense form	First V in ms.	Following C in ms.
gabi	195	98
gapi	171	140
kabi	212	91
kapi	183	131

Again, then, if temporal relationships are an argument for syllable constituency, we would not expect to find them across syllable-boundaries, as we do in these data. Thus, the existence of a temporal relationship between peak and coda is not evidence for the rhyme, but rather an instance of a more general relationship between a vowel and the following consonant.

To summarize so far, if all the arguments just discussed are valid for establishing constituency, then, not only do peak and coda form a constituent, but so do onset and coda (because there can be phonotactic constraints between them), as well as onset and peak (because they can be the domain of phonetic processes, and figure crucially in stress-placement rules, — e.g., in Aranda). These arguments for constituency would thus lead to a syllable structure where there is "double motherhood" for each of onset, peak, and coda, and hence would yield a syllable with the following structure:



The implausibility of such a structure leads one to conclude that dependencies (e.g., phonotactic constraints) and mention in rule-environments (e.g., stress-assignment rules, and other language-specific processes) do not, after all, establish constituency in

phonology — any more than, say, Subject-Verb Agreement (a dependency) and Subject-Aux Inversion (an environmental mention) establish the constituency of Subject NP and Aux (or Verb) in syntax. Rather, it is advisable to recall that in syntax, movement rules (plus deletion and anaphora) provide the main evidence for constituency. But, given that this is the case, one is left with absolutely no valid evidence for the constituency of the rhyme.

Now, even though advocates of the rhyme have not previously considered this type of evidence in sound structure, it may perhaps still be the case that phonological "movement" rules could validate syllable-internal constituency. However, if they do, then they, too, fail to support the rhyme.

Among the common transposition speech-errors (which may be considered movement rules) are ones involving phoneme-reversals, such as "Rhine wacks" for "wine racks" and "torn the Kerner" for "turn the corner." In these cases, only onsets and peaks are reversed. However, though there are cases where the rhymes in two words can be reversed (e.g., "our backyoad is full of tards", for "our backyard is full of toads"; "hunk of jeap", for "heap of junk"), there are also cases where the onset and the peak are interchanged (e.g. "cassy put", for "pussy cat"; "piss and stretch", for "stress and pitch"). From examples like these, Fromkin (1971:33) observes "... a CV or VC sequence which is part of a syllable can be involved in speech errors." Thus, speech errors do not at all support the constituency of the rhyme.

In view of the preceding arguments against a hierarchical arrangement of the syllable-internal constituents, a flat or level structure is left as the only possibility. It is only such a structure that can allow for the different possible interactions of onset, peak, and coda. And thus, the only reasonable internal structure for the syllable is one that has no rhyme.

References

- Chen, M. (1970) "Vowel Length Variation as a Function of the Consonant Environment," Phonetica 22.
- Dixon, R.M.W. (1977) A Grammar of Yidin^y, Cambridge University Press, Cambridge.
- Frantz, C. & M. Frantz (1973) "Gadsup Phoneme and Toneme Units," in H. McKaughan, ed., The Languages of the Eastern Family of the East New Guinea Highland Stock, University of Washington Press, Seattle.
- Fromkin, V. (1971) "The non-anomalous nature of anomalous utterances," Language 47.
- Halle, M. & J.-R. Vergnaud (1978) "Metrical Structure in Phonology," unpublished MS, MIT, Cambridge, Massachusetts.

- Halle, M. & J.-R. Vergnaud (1980) "Three Dimensional Phonology," Journal of Linguistic Research 1.
- Hyman, L. (1977) "On the Nature of Linguistic Stress," in L. Hyman, ed., Studies in Stress and Accent, Southern California Occasional Papers in Linguistics, University of Southern California Linguistics Department, Los Angeles.
- Kim, K.-O. (1975) "The Nature of Temporal Relationship Between Adjacent Segments in Spoken Korean," Phonetica 31.
- Lisker, L. (1978) "Segment Duration, Voicing, and the Syllable," in Bell & Hooper, ed., Syllables and Segments, North-Holland publishing Co., Amsterdam.
- McCarthy, J. (1978) "On Stress and Syllabification," unpublished MS, MIT, Cambridge, Massachusetts.
- McCarthy, J. (1979) "On Stress and Syllabification," LI 10.
- Nash, D. (1979/1980) "Yidin^y Stress: A Metrical Account," CUNYForum 7-8.
- Pike, K. & E. Pike (1947) "Immediate Constituents of Mazteco Syllables," IJAL 13.
- Selkirk, E. (1978) "On Prosodic Structure and Its Relation to Syntactic Structure," unpublished MS, University of Massachusetts, Amherst.
- Strehlow, T.G.H. (1942) "Aranda Phonetics," Oceania 12.